DISCUSSION ON THE RESULTS OF A GRAVIMETRIC SURVEY OF THE PHILIPPINE ISLANDS

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The first fact which strikes the eye is the extreme complexity of the deep sub-stratum. Although in the other countries which we have explored, it sufficed to establish several stations rather far apart to obtain the physiognomy of the intermediate stations before determining them more accurately later on, in the Philippines it was always impossible to predict the result in advance, even if only approximately; each new station, in spite of the closeness of the net, brought out some new fact. It is true that, once the expedition was completed, the results were easily grouped and the diverse regions plotted in; still these limits were not always well defined in such a manner that the maxima and minima could be readily localised.

A precise net in the Philippines would require at least three or four times the number of stations which would otherwise be needed, even in regions of the closest net, with their spacing not more than 20 kilometers apart.

A close relationship appears between the gravimetric anomalies and the topography. Although on the Asiatic Continent, in China as in Indo-China, in all the mountainous massif, we found negative anomalies as a rule very generally proportioned in accordance with the size of the massifs, here, almost always, we found strong positive anomalies.

We noted several exceptions to this law, but these were so very rare that we may state the presence of positive anomalies in the mountains constituted the most salient feature of the Philippines. We were able to foresee this in 1934, the station at Baguio having shown at that time a remarkable exception to the general law which had been verified everywhere in China. Later on, we shall give a more detailed study and explanation of this fact. For the present we shall conclude that the mountainous formations in the Philippines have an internal structure quite different from those of the Asiatic chains, a supplementary argument for those geologists who refuse to admit a separation of the islands by the subsidence of the China Sea: the sub-strata do not resemble each other.

Another idea incited us to undertake this expedition. The Philippines are surrounded on all sides by very profound oceanic deeps, of which the isostatic compensation was known, at least with regard to some of them, since the expedition of M. VENING MEINESZ. We had hoped to be able to complete this study, by approaching these deeps as closely as possible from the coasts. Unfortunately, we found the entire east coasts of Luzon, Samar and Mindinao practically inaccessible. The strong swell of the Pacific had forced the abandonment of the regular steamship lines and the economic crisis had considerably reduced the exports from these regions, which are still very little exploited. It is true that we might have profited by the voyage to the east coast of Samar of the United States Coast and Geodetic Survey vessel, on which we had very kindly been invited to take passage. But the duration of the voyage increased by other work, would have been too long, and to our great regret we were obliged to renounce this opportunity for measurements which was thus made possible for us.

No new data are therefore to be found in this publication on the action of the great Deeps of the Pacific. Up to the present only the two stations established by the United States Coast and Geodetic Survey, one at Samar and the other at Surigao (+ 121 and + 127 milligals), indicate that this action extends along the eastern coasts.

On the other hand, the deeps of 2000 meters which are found about fifty kilometers from Cape Bojeador, explain, at least in part, the strong positive anomalies of the north-eastern extremity of Luzon; the deeps of 1200 meters which extend along the west coast of Zambales, coincide with the presence of the strong positive anomalies to the westward of the center of Luzon. Undoubtedly, as we shall see further on, these last anomalies cannot

be attributed, for the greater part, to the oceanic compensations, because the horizontal gradient is in the opposite direction to that which it should be, the anomalies increasing towards the centre of the island; but a certain part of the positive anomalies may however very probably be attributed to them.

To the southwest of Negros, a station of M. VENING MEINESZ, at about 100 kilom. from the coast, above the great deeps of the Sulu Sea, has shown an anomaly of 284 milligals; on the coast one finds very strong anomalies (+ 121, + 66) of which a part, are, undoubtedly due to compensations of the maritime depths. The depths are rather great, of the order of 1000 meters, up to a distance of 20 kilometers from the coast.

Although in the immediate vicinity of Zamboanga, the south-west extremity of Mindanao, the depths are less, this station is located between two depressions, the one 75 kilometers to the northwest and the other at the same distance to the southwest, The strong positive anomaly of Zamboanga (115) is evidently related to that which M. VENING MEINESZ found at sea above these deeps.

Thus it appears that the entire coast in the vicinity of these oceanic deeps is marked by strong positive anomalies conforming to the general law.